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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/907,364	07/17/2001	Bo Su Chen	M40 01375 US	6467

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EXAMINER	
FUREMAN, JARED	
ART UNIT	**PAPER NUMBER**
2876	

DATE MAILED: 03/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/907,364	CHEN, BO SU	
	Examiner	Art Unit	
	Jared J. Fureman	2876	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 November 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-14,16-19 and 21-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-14,16-19 and 21-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 July 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Receipt is acknowledged of the amendment, filed on 11/14/2003, which has been entered in the file. Claims 1, 3-14, 16-19, and 21-32 are pending.

Specification

1. The abstract of the disclosure is objected to because the abstract is greater than 150 words. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 3-7, 9, 10-12, 14, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pinnock (WO 99/39169 A1, previously cited) in view of Cui et al (US 6,399,940 B1, previously cited).

Re claims 1, 3-7, 9, and 10: Pinnock teaches a method for analyzing the performance of a system, comprising the steps of: directing light from at least one light source (20) to an encoded portion (slots 16 or 18) of a rotating member (disk elements 10 or 12) of said system, said method comprising the steps of: transmitting a portion of the light to said encoded portion of said rotating member; detecting (via sensor array 22) a transmitted portion of the light; and recovering information from said transmitted portion of the light containing performance characteristic data of said system; wherein the encoded portion of the rotating member comprises a bar code (disk element 12

includes slots 18 representing a portion of disk element 12 having higher optical transmissivity than the portions ("spokes") which separate the slots, thus, the encoded portion can be considered a bar code); wherein the encoded portion of the rotating member comprises at least one measuring feature (optical transmissivity) formed on a planar surface of the rotating member; wherein said at least one measuring feature formed on said planar surface of said rotating member comprises an optical encoder (the slots 18 and "spokes" represent an optical encoder) for encoding performance characteristic data of the system; configuring a plurality of measuring features (slots 18 and "spokes") to form a vernier for measuring movement within the system; shaping said encoded portion of said rotating member to increase transmission of said transmitted light in a particular direction (the slots 18 have increased optical transmissivity than the "spokes" between the slots); assessing said system utilizing said performance characteristic data; generating an electrical feedback signal from information recovered from said transmitted portion of the light (the sensor array 22 generates an electrical signal); and providing said electrical feedback signal to an input of said system (data processor 24), thereby improving said performance characteristic data of said system (see figures 1-7, page 2 line 4 - page 3 line 7, and page 7 line 6 - page 10 line 8).

Pinnock fails to specifically teach the light source comprising a vertical cavity surface-emitting laser.

Cui et al teaches a method and apparatus for measuring the performance of a system, including the use of a vertical cavity surface-emitting laser (see column 7 lines 31-37).

In view of Cui et al's teachings, it would have been obvious to one of ordinary skill in the art at the time of the invention to include, with the method and apparatus as taught by Pinnock, the light source comprising a vertical cavity surface emitting laser, in order to provide a compact laser diode for the light source, thereby reducing the size of the apparatus.

Re claims 11, 12, 14, and 16: Pinnock also teaches an apparatus for analyzing the performance of a system having a rotating member (disk elements 10 or 12) therein, said apparatus comprising: at least one directing element (a diffuser, not shown) that directs light from a light source (20) in order to intercept an encoded portion of said rotating member; at least one transmitting element (slots 16 or 18, having a higher optical transmissivity) that transmits a transmitted portion of said light from said encoded portion of said rotating member; and at least one detector (sensor array 22) that detects the transmitted portion of said light to recover performance information maintained therein, wherein said performance information contains performance characteristics (torque and angular position) of said system; recovery mechanism (data processor 24) that recovers information about a performance characteristic of said system; wherein the directing element comprises an optical lens (the diffuser represents an optical lens) (see figures 1-7, page 2 line 4 - page 3 line 7, and page 7 line 6 - page 10 line 8).

Pinnock fails to specifically teach the light source comprising a vertical cavity surface-emitting laser.

Cui et al teaches a method and apparatus for measuring the performance of a system, including the use of a vertical cavity surface-emitting laser (see column 7 lines 31-37).

In view of Cui et al's teachings, it would have been obvious to one of ordinary skill in the art at the time of the invention to include, with the method and apparatus as taught by Pinnock, the light source comprising a vertical cavity surface emitting laser, in order to provide a compact laser diode for the light source, thereby reducing the size of the apparatus.

4. Claims 8, 13, 17-19, and 21-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pinnock in view Cui et al and of Burke, Jr (US 3,688,570).

The teachings of Pinnock have been discussed above. Pinnock also teaches an apparatus for detecting the relative motion between at least two rotating members in a system having a light source (20) for generating a light beam, said apparatus comprising: transmissive mechanism (slot 16) located on a first rotating member (disk element 10) for the transmission of said light beam from an encoded portion of said first rotating member; transmissive mechanism (slot 18) located on a second rotating member (disk element 12) for the transmission of said light beam through said encoded portion of said first rotating member; and a detector (sensor array 22), wherein said detector is located proximate to said system; a collimating lens (a diffuser, not shown) located proximate said system, wherein said collimating lens renders said

light beam from said light source into a highly collimated parallel light beam, thereby directing said light beam to intercept said encoded portion on said first rotating member; wherein said at least one encoded portion comprises: a transparent polymer film (annular overlay 100) having parallel lines of opaque bar code imprinted on an upper surface of said transparent polymer film; and wherein said opaque parallel lines are spaced evenly with a width of a gap formed therebetween, wherein the width of the gap corresponds to the width of said opaque parallel lines; and wherein said transparent polymer film is fixed to a rotating member (disk element 12); wherein said transparent polymer film comprises a bar code when adhered to a rotating disk; and wherein said bar code is adhered to a planar surface of a rotating member; wherein said light beam intercepts said first and second encoded portions of said rotating members at an angle of incidence of about 90.degree.; and wherein said light beam carries an image of said bar code after being transmitted through said encoded portions of said first and second rotating members; wherein said detector is located on a sensor (the sensor array 22 contains many detectors); wherein said encoded portion of the first rotating member is shaped to increase said transmitted light in a particular direction; wherein said encoded portion of the first rotating member is shaped to form an optical encoder for encoding information representing performance characteristics of said system; wherein said encoded portion of the first rotating member is provided as a vernier on said rotating member to increase accuracy for sensing motion thereof; wherein said encoded portion of the first rotating member comprises features recessed (the slots 16 and 18 are recessed into the surface of the disk elements 10 and 12,

respectively) into a surface or edge of said rotating member (see figures 1-7, page 2 line 4 - page 3 line 7, and page 7 line 6 - page 10 line 8).

Pinnock fails to specifically teach the light source comprising a vertical cavity surface-emitting laser.

Cui et al teaches a method and apparatus for measuring the performance of a system, including the use of a vertical cavity surface-emitting laser (see column 7 lines 31-37).

In view of Cui et al's teachings, it would have been obvious to one of ordinary skill in the art at the time of the invention to include, with the method and apparatus as taught by Pinnock, the light source comprising a vertical cavity surface emitting laser, in order to provide a compact laser diode for the light source, thereby reducing the size of the apparatus.

Pinnock as modified by Cui et al fails to specifically teach transmitting at least one light beam from said encoded portions of said rotating member to interact with at least one other light beam to form Moiré fringes on a sensor; the detector detecting Moiré fringes formed as a result of the interaction of images from said first and second encoded portions of said first and second rotating members.

Burke, Jr teaches a method and apparatus for analyzing the performance of a system, comprising: a first encoded rotating member (shell 14), a second encoded rotating member (shell 22), a light source (32) generating a light beam, a sensor/detector (48, 53) receiving a light beam from the first encoded member and a light beam from the second encoded member to form Moiré fringes on the

sensor/detector as a result of the interaction of images from the first and second encoded portions of the first and second rotating members (see figures 1A, 1, 2, 4, column 1 lines 4-6, 59-67, and column 2 line 56 - column 5 line 64).

In view of Burke, Jr's teachings, it would have been obvious to one of ordinary skill in the art at the time of the invention to include, with the method and apparatus as taught by Pinnock as modified by Cui et al, transmitting at least one light beam from said encoded portions of said rotating member to interact with at least one other light beam to form Moiré fringes on a sensor; the detector detecting Moiré fringes formed as a result of the interaction of images from said first and second encoded portions of said first and second rotating members, in order to take advantage of the sensitivity and displacement amplification capabilities of the Moiré fringe system (see column 3 lines 40-45 of Burke, Jr).

Response to Arguments

5. Applicant's arguments filed 11/14/2003 have been fully considered but they are not persuasive.

In response to applicant's argument that one of ordinary skill in the art could not combine Ciu et al and Pinnock as suggested by Examiner to render Applicant's invention obvious prior to Applicant's filing date (see page 10 of the amendment filed on 11/14/2003), according to MPEP 2141.01 I, prior art that is available under 35 U.S.C 102 is available under 35 U.S.C. 103. Since Cui et al is available prior art under at least 35 U.S.C. 102(e), Cui et al is valid prior art under 35 U.S.C. 103(a). Thus, the combination of Pinnock, Cui et al, and Burke, Jr meets the claimed limitations.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Heisenberg et al (US 2003/0145663 A1), Dalton et al (US 6,679,126 B2), Braun (US 6,660,998 B1), and Gelbart (US 6,587,211 B1) all teach methods and apparatus for measuring the performance of a system.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jared J. Fureman whose telephone number is (571) 272-2391. The examiner can normally be reached on 7:00 am - 4:30 PM M-T, and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Lee can be reached on (571) 272-2398. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

February 9, 2004

Jared J. Fureman

JARED J. FUREMAN
PRIMARY EXAMINER